202206UECM3463OE4a

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Review of preview

Started on	Monday, 5 September 2022, 03:22 PM
Completed on	Monday, 5 September 2022, 03:22 PM
Time taken	7 secs
Grade	**0** out of a maximum of 10 (**0**%)

1

Marks: 0/1

You are given the following claim frequency data:

Number of Claims	0	1	2	3	4	≥ 5
Number of risks	15	10	8	8	7	13

The null hypothesis that the number of claims per risk follows a Poisson distribution with mean θ. Let Q be the value of the chi-square statistic and u be the degrees of freedom. Determine Q+u. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 35.6017

Marks for this submission: 0/1.

2

Marks: 0/1

You are given the following:

- 121 observed losses have been recorded an are grouped as follows:

Interval	Number of Losses
[0,1)	19
[1,5)	44
[5,10)	23
[10,15)	24
[15,∞)	11

- The random variable X underlying the observed losses, is believed to follow the exponential disribution with mean 5.

Determine the value of Pearson's goodness-of-fit statistic. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 25.502549

Marks for this submission: 0/1.

3

Marks: 0/1

You are given the following:

- 1148 observed losses have been recorded and are grouped as follows:

Interval	Number of Losses
[0,1)	111
[1,5)	331
[5,10)	339

[10,15)	227
[15, ∞)	140

- The random variable X underlying the observed losses, is believed to follow the gamma disribution with $\alpha = 2$ and $\theta = 5$.

Determine the value of Pearson's goodness-of-fit statistic. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 457.803573
Marks for this submission: 0/1.

4
Marks: 0/1

A random sample of 8 claims $x_1, ..., x_8$ is taken from the probability density function

$$f(x_i) = (\alpha\, \theta^{\alpha})/(x_i^{\alpha+1}),\ \alpha, \theta > 0,\ x_i > \theta.$$

In ascending order the observations are:
192, 195,197, 199, 204, 206, 210, 237
Suppose the parameters are $\alpha = 6$ and $\theta = 192$. Commonly used critical values for this test are

α	0.10	0.05	0.025	0.01
Critical Value	$1.22/\sqrt{n}$	$1.36/\sqrt{n}$	$1.48/\sqrt{n}$	$1.63/\sqrt{n}$

Determine the Kolmogrov-Smirnov statistic for the fitted distribution. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 0.4591
Marks for this submission: 0/1.

5
Marks: 0/1

A random sample of 10 claims $x_1, ..., x_{10}$ is taken from the probability density function

$$f(x_i) = 1/[\Gamma(\alpha)\theta^{\alpha}]x_i^{\alpha-1}e^{-x_i/\theta},\ x_i > 0.$$

In ascending order the observations are:
35.53, 64.12, 67.22, 75.35, 79.22, 106.82, 134.72, 137.84, 143.04, 265.81
Suppose the parameters are $\alpha = 3$ and $\theta = 35$. Commonly used critical values for this test are

α	0.10	0.05	0.025	0.01
Critical Value	$1.22/\sqrt{n}$	$1.36/\sqrt{n}$	$1.48/\sqrt{n}$	$1.63/\sqrt{n}$

Determine the Kolmogrov-Smirnov statistic for the fitted distribution. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 0.178
Marks for this submission: 0/1.

6
Marks: 0/1

You fit a Pareto distribution to a sample of 250 claim amounts and use the likelihood ratio test to test the hypothesis that $\alpha = 1.5$ and $\theta = 6.5$. You are given:

- The maximum likelihood estimates are $\hat{\alpha} = 1.4$ and $\hat{\theta} = 6.2$.
- $\Sigma \ln(x_i+6.5) = 691.05$
- $\Sigma \ln(x_i+6.2) = 600.05$

Let Q be the value of the likelihood ratio test statistic and u be the degrees of freedom. Determine Q-u. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 411.84
Marks for this submission: 0/1.

7
Marks: 0/1

You fit a Weibull distribution to a sample of 20 claim amounts. You test $H_0: \tau = 2$ versus $H_1: \tau \neq 2$ using the likelihood ratio statistic. You are given:

- $\Sigma \ln x_i = 71.8411$
- $\Sigma x_i^2 = 86760$
- At the maximum likelihood estimate, the loglikelihood is -98.393
- The maximum likelihood estimate of θ when $\tau = 2$ is $\hat{\theta} = 65.8635$

Determine the likelihood ratio statistic. _____

Answer: ✗

Make comment or override grade

Incorrect
Correct answer: 6.8126
Marks for this submission: 0/1.

8
Marks: 0/1

Suppose that $X_1, ..., X_8$ denotes a random sample from the probability density function given by

$$f(x|\theta_1, \theta_2) = 1/\theta_1 e^{-(x-\theta_2)/\theta_1}, x > \theta_2$$

The following random sample of 8 has been observed:

62, 125, 17, 47, 30, 25, 34, 53

Determne the likelihood ratio test statistc for testing H_0: $\theta_1 = 84.5$ versus H_1: $\theta_1 > 84.5$ with θ_2 _____

Answer: ✗

Make comment or override grade

Incorrect
Correct answer: 5.558019
Marks for this submission: 0/1.

9
Marks: 0/1

Suppose that $X_1, ..., X_{10}$ denotes a random sample from the probability density function given by

$$f(x|\theta_1, \theta_2) = 1/\theta_1 e^{-(x-\theta_2)/\theta_1}, x > \theta_2$$

The following random sample of 10 has been observed:

65, 19, 84, 65, 63, 50, 36, 98, 47, 43

Determne the likelihood test statistc for testing H_0: $\theta_2 = 16.8$ versus H_1: $\theta_2 > 16.8$ with θ_1 unknown. _____

Answer: ✗

Make comment or override grade

Incorrect
Correct answer: 1.125642
Marks for this submission: 0/1.

10
Marks: 0/1

You are given the following observed claim frequency data collected over a period of 365 days:

Number of Claims per Day	Observed Number of Days
0	58
1	123
2	117
3	67
4+	0

Fit a Poisson distribution to the above data, using the method of maximum likelihood. Group the data by number of claims per day into four groups:0,1,2,3.
Apply the chi square goodness of fit test to evaluate the null hypothesis that the claims follow a Poisson distribution. Let T be the value of the chi-square statistic and v be the degrees of freedom. Determine T-v. _____

Answer: ✗

Make comment or override grade

Incorrect
Correct answer: 10.6045
Marks for this submission: 0/1.